



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,437	01/28/2004	Michael Joseph Reale	140069	3602
7590 03/02/2006				
John S. Beulick Armstrong Teasdale LLP Suite 2600 One Metropolitan Square St. Louis, MO 63102		EXAMINER KIM, TAE JUN		
		ART UNIT PAPER NUMBER		
		3746		
DATE MAILED: 03/02/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/766,437	<b>Applicant(s)</b> REALE ET AL.	
	<b>Examiner</b> Ted Kim	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 21-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 7, 9-11, 15, 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nettel et al (2,372,846) in view of Erickson (6,412,291) or Zaugg (4,522,024). Nettel et al teach a cooling system for a gas turbine engine that includes at least a first compressor 1, a second compressor 9, and a turbine (col. 1, line 6), said cooling system comprising: an intercooler 7 coupled downstream from the first compressor 1 such that compressed air discharged from the first compressor is routed therethrough, said intercooler 7 having a working fluid flowing therethrough; and an injection system 4 (Fig. 1) coupled in flow communication with said intercooler 7, said injection system configured to channel condensate 13 into the second compressor at a predetermined rate to facilitate reducing an operating temperature of the gas turbine engine, the intercooler 7 further has a condensate drain valve 4. Nettel et al do not teach recirculating the condensate from 14 to the injection point 4. Erickson also teaches a gas turbine with an injection system 27 where the condensate from the cooler 11 is recirculated via pump 32 to the water injection system which reduces the demand for

external water (col. 2, lines 30-32, 38+). Zaugg teaches a cooling system for a gas turbine engine that includes at least a first compressor 3, a second compressor 3, and a turbine 1, said cooling system comprising: an intercooler 5 (left) coupled downstream from the first compressor such that compressed air discharged from the first compressor is routed therethrough, said intercooler having a working fluid flowing therethrough; and an injection system 16 coupled in flow communication with said intercooler 5, said injection system configured to channel condensate 10 formed in said intercooler into the combustor 9; further comprising a condensate holding tank 11 in flow communication with said intercooler, said condensate holding tank configured to receive said condensate formed in said intercooler; further comprising a first pump 12 coupled in flow communication with said condensate holding tank; said first pump directs said condensate to a second holding tank 13; further comprising a second pump 15, different than said first pump, in flow communication with said second holding tank, said second pump configured to channel condensate from said second holding tank to said condensate injection system 9. It would have been obvious to one of ordinary skill in the art to source the water for injection 4 from the condensate and/or to use the pumping and water storage system of Zaugg to recirculate the water and reduce the demand for external water.

3. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zaugg (4,522,024) in view of either Anderson (5,66,9217) and/or Payling (6,467,252) and optionally Tsukamoto et al (6,397,578). Zaugg teaches a cooling system for a gas turbine

Art Unit: 3746

engine that includes at least a first compressor 3, a second compressor 3, and a turbine 1, said cooling system comprising: an intercooler 5 (left) coupled downstream from the first compressor such that compressed air discharged from the first compressor is routed therethrough, said intercooler having a working fluid flowing therethrough; and an injection system 16 coupled in flow communication with said intercooler 5, said injection system configured to channel condensate 10 formed in said intercooler into the combustor 9; further comprising a condensate holding tank 11 in flow communication with said intercooler, said condensate holding tank configured to receive said condensate formed in said intercooler; further comprising a first pump 12 coupled in flow communication with said condensate holding tank; said first pump directs said condensate to a second holding tank 13; further comprising a second pump 15, different than said first pump, in flow communication with said second holding tank, said second pump configured to channel condensate from said second holding tank to said condensate injection system 9. Zaugg does not teach injecting the water from the condensate into an injection system circumferentially spaced at the inlet of the second compressor nor the use of a demineralizer. Anderson teaches injecting condensate from pumps 22, 24 into both a circumferential array of nozzles 21 upstream of the second compressor 6 and downstream of the first compressor 5 as well as injecting the water 25 into the combustor, where the water injection between compressor stages cools the air (col. 2, lines 26+) which serves to reduce compressor power and increase the overall power from the turbine (col. 6, lines 1-4). Payling et al teach using an intercooler 68 between compressor stages

Art Unit: 3746

52, 54 and using injected water 64 via circumferentially spaced injectors between the first 52 and second 54 compressors where the water injection serves to cool the compressor air, reduce compressor horsepower used and increase engine output levels (col. 2, lines 40-57). The demineralized water (col. 10, lines 16+) is pumped to the water injection system. It would have been obvious to one of ordinary skill in the art to inject the water between the compressor stages, as taught by Anderson and/or Payling, in order to cool the compressor air, to reduce compressor power and increase the overall power from the turbine/output levels. As for the demineralizer, Tsukamoto et al teach using a demineralizer 16 upstream of the pump 17 for the condensate from 15 which is recirculated back into the gas turbine. It would have been obvious to one of ordinary skill in the art to employ a demineralizer before the pump 12 of Zaugg, in order to purify the water and reduce corrosion and/or fouling of the water injectors.

4. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Payling et al (6,467,252) in view of Zaugg (4,522,024) and optionally Tsukamoto et al (6,397,578). Payling et al teach a cooling system for a gas turbine engine that includes at least a first compressor 52, a second compressor 54, and a turbine 58, said cooling system comprising: an intercooler 68 coupled downstream from the first compressor such that compressed air discharged from the first compressor is routed therethrough, said intercooler having a working fluid flowing therethrough; and an injection system 64, said injection system configured to channel water into the second compressor 54 at a predetermined rate to facilitate reducing an operating temperature of the gas turbine .

Art Unit: 3746

engine; a second pump 352 for pumping demineralized water (col. 10, lines 16+) to the injection system. Payling et al do not teach using the water condensed from the intercooler for the water that is injected into the second compressor. Zaugg teaches a cooling system for a gas turbine engine that includes at least a first compressor 3, a second compressor 3, and a turbine 1, said cooling system comprising: an intercooler 5 (left) coupled downstream from the first compressor such that compressed air discharged from the first compressor is routed therethrough, said intercooler having a working fluid flowing therethrough; and an injection system 16 coupled in flow communication with said intercooler 5, said injection system configured to channel condensate 10 formed in said intercooler into the combustor 9; further comprising a condensate holding tank 11 in flow communication with said intercooler, said condensate holding tank configured to receive said condensate formed in said intercooler; further comprising a first pump 12 coupled in flow communication with said condensate holding tank; said first pump directs said condensate to a second holding tank 13; further comprising a second pump 15, different than said first pump, in flow communication with said second holding tank, said second pump configured to channel condensate from said second holding tank to said condensate injection system 9. Zaugg clearly teaches that the water is condensed into the intercooler 5 and the condensate is conveniently recirculated back into the gas turbine system, which reduces the demand for external water (col. 1, lines 64+) and enhances the thermodynamic efficiency. It would have been obvious to one of ordinary skill in the art to use the condensate from the intercooler of Payling et al, as taught by

Zaugg, in order to reduce the demand for external water (col. 1, lines 64+) and enhance the overall thermodynamic efficiency. As for the demineralizer, Tsukamoto et al teach using a demineralizer 16 upstream of the pump 17 for the condensate from 15 which is recirculated back into the gas turbine. It would have been obvious to one of ordinary skill in the art to employ a demineralizer before the pump 12 of Zaugg, in order to purify the water and reduce corrosion and/or fouling of the water injectors.

***Response to Arguments***

5. Applicant's arguments filed 01/10/2006 have been fully considered but they are not persuasive. Applicant's arguments are based on several central arguments that are repeated throughout.

6. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

7. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the



references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, express motivation to apply the Zaugg or Erickson references can be found to recirculate the water to the water injection system which reduces the demand for external water. Express motivation to apply the Anderson is that the water injection between compressor stages cools the air (col. 2, lines 26+) which serves to reduce compressor power and increase the overall power from the turbine (col. 6, lines 1-4). Express motivation to apply Payling et al is that the water injection serves to cool the compressor air, reduce compressor horsepower used and increase engine output levels (col. 2, lines 40-57).

8. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

9. The argument that the applied references “teach away” from the claimed subject matter is not persuasive. A reference will teach away only if it suggests that the line of development flowing from the reference’s disclosure is unlikely to be productive of the results sought by the inventor. *In re Gurly*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). From a review of the disclosures of the applied references, it is clear that these references do not “teach away” from the claimed invention, since none of their

disclosures teaches, either expressly or impliedly, that it is undesirable to combine the references, especially as there is express motivation to combine them as discussed above.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

#### ***Contact Information***


Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

Art Unit: 3746

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



---

Ted Kim	Telephone	571-272-4829
Primary Examiner	Fax (Regular)	571-273-8300
February 22, 2006	Fax (After Final)	571-273-8300
Technology Center 3700 Receptionist	Telephone	703-308-0861
Patents Assistance Center	Telephone	800-786-9199